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THE RABBIT PEST AT THE ANTIPODES, AND THE REMEDY PROPOSED BY M. PASTEUR.

THE influence of small mammals upon agriculture and arboriculture is a subject of much importance, and one upon which, from time to time, a good deal has been written. These creatures affect our interests in various ways: some are beneficial, others so injurious that the only question is how to keep down their numbers; while of those which possess both good and bad qualities a close observation of their habits is necessary before we can decide whether, on the whole, they are beneficial to man or the contrary.

Dr. Hart Merriam, in his Report to the Department of Agriculture, Washington, for the year 1886, referring to the effects of mammals upon agriculture, particularly mentions the hordes of mice which periodically overrun the country from the Atlantic to the Pacific, and from the Mexican border to Canada, doing an amount of damage which in the aggregate must amount to several millions of dollars a-year. In the meadow and pasture they feed upon the roots of the best grasses; in the garden upon the roots, fruit, and seeds of vegetables; and in the fields upon grain, both standing and in the shock. In winter they destroy fruit and forest trees and ornamental shrubs by eating the bark from the roots and trunk. The number of Meadow Mice distributed over a given area is subject to periodical fluctuations, and they sometimes become enormously abundant. At such times, says Dr. Hart Merriam,



their runways through the meadows and grain-fields result in the loss of at least one-fifth of the crop.

Again, the depredations of Ground Squirrels and Gophers in the prairie regions of the Mississippi Valley, and in the far west, are well known, and yet the extent of the damage they do is not generally recognised. In a fertile part of the Sacramento Valley, in California, a few years ago, the sudden increase in a species of Ground Squirrel which fed upon grain caused the land to depreciate one-half in value; or, to be more explicit, land which previously fetched one hundred dollars an acre could not be sold for fifty; and this depreciation was due solely to the abundance and ravages of the Squirrels.

Here, in England, it is on record that different parts of the country have, at various times, been overrun with a plague of Field Mice, which has caused incalculable damage to trees and crops, and has been only partially checked by devices for trapping them, and by the attacks of birds of prey, especially the Short-eared Owl, *Asio accipitrinus*. Thus Jesse, in his 'Gleanings in Natural History,' describes how the trees in the Forest of Dean, in Gloucestershire, were seriously damaged by Field Mice, great numbers of which were taken in pitfalls of a peculiar construction. Childrey, in his 'Britannia Baconica,' 1660 (p. 14), mentions a similar swarm of mice which appeared in Denge Hundred, Essex, in 1580, and eat up all the roots of the grass. "A great number of Owles," he says, "of strange and various colours assembled and devoured them all, and after they had made an end of their prey, they took flight back again from whence they came." From this we may infer that this plague occurred in the autumn, when the Short-eared Owls arriving from Norway and Sweden to spend the winter here, fared sumptuously upon the mice until the time came for them to leave us in the following spring.

A similar account from Market Downham, in Suffolk, is given in the 'London Magazine' for 1754, where we are told that "the parishioners pay almost the same veneration to the Norway Owls as the Egyptians did to the Sacred Ibis, and will not at any rate annoy them, on account of their destroying the Field Mice, with which they are infested commonly about once in six or seven years."

But of all plagues of this kind in modern times, none

probably has ever equalled the plague of Rabbits from which, through man's folly, the colonists in Australia and New Zealand are now suffering. The introduction and, so-called, "acclimatisation" of the Rabbit in Australia, so far from proving, as was expected, a blessing, by increasing the food supply for colonists, has proved to be a curse, by ruining the sheep-runs upon which the wealth of the country mainly depended, and destroying the vegetation throughout many fertile districts.

The Report of Mr. Morgan, the United States Consul-General at Melbourne, Victoria, in 1886, furnishes the best account we have seen of the introduction of the Rabbit into Australia, and the disastrous results which followed. From this Report we learn that, although tame Rabbits were brought to the colonies in very early years, it was not until 1860 that the common grey Wild Rabbit was (so far as can be authoritatively ascertained) introduced by a large landed proprietor in the western district of Victoria for the purpose of sport. From this western district they spread to the stony rises between Colac and Camperdown, in which place the splendid cover afforded them caused their rapid increase, and they multiplied with such astounding rapidity as literally to overrun all that portion of country.

In Charles Darwin's celebrated Essay "On the tendency of Species to form Varieties,"* the following passage occurs (p. 47):—"Where man has introduced plants and animals into a new and favourable country, there are many accounts in how surprisingly few years the whole country has become stocked with them." Had these lines been penned a few years later than the date of their publication, the writer could have found no better illustration than the history of the Rabbit in Australia.

Some time after 1860, Rabbits were taken to other parts of Victoria, and were soon found in the neighbourhood of Horsham, spreading thence into the Mallee country, extending north-east to Swan Hill. The country west and north of Horsham being exceedingly favourable to them, consisting of sand-hills, pine-ridges, and scrub, they increased there greatly, and have done serious damage to crops during the past few years, principally since 1874.

* Journ. Linn. Soc. vol. iii. pp. 45—62 (1858).

So great has been their fecundity that there are now but few places in Victoria in which they do not exist—from Point Nepean, along the coast from Queenscliff to Geelong; in Gisborne, Ballan, Bacchus Marsh; away north-west to Nhill and north to Swan Hill; along the Murray River; on the New South Wales and the South Australian borders—Gippsland, and the surrounding district, being the only place in which they are conspicuous by their absence.

In the rangy district of Mansfield they have made an appearance, and the Buffalo, Howqua, King, and other rivers in the neighbourhood of Bright and Myrtleford, are now invaded by these pests in large numbers. It is, however, noticeable that in places where the soil is hard, or the climate cold or wet, the Rabbit does not increase to anything like the extent observable in country more suited to them, such as sand-hills, pine-ridges, &c. There is also another peculiarity observed, which will be borne out by all who have had any great experience on this subject, namely, that where Hares increase and become numerous the Rabbits do not. There may be an exception to this, such as on the Werribee Estate, but nevertheless it is the rule.

It is doubtful, says Mr. Morgan, whether many persons are aware of the immense loss which has been sustained in this colony through the ravages of the Rabbits, but it is an undoubted fact that as much as £23,000 has been expended to clear one estate, and keep the pests under, and in many others it has cost the owners large sums from £15,000 downwards.

In 1877 Bruin Station carried 36,000 sheep, rental, £500; in 1879, 10,000, run abandoned; re-let under grazing license for £56. Wanga and Nipo, once carrying 20,000 sheep; rental, £400; now not a sheep on the run, which was also abandoned, and re-let for £20. Lake Hindmarsh carried, in 1877, 33,000 sheep; lost 25,000 in two years; rent £700, now £72. Corong, in 1877, 36,000 sheep, now 3000; rent £1050, now £150; and several others are mentioned as being in an equally bad position.

During the years 1884, 1885, 1886 the Government expended, in the extirpation of Rabbits in Victoria, about £30,000, chiefly by poisoning with phosphorized oats and wheat, arsenic in bran and chaff, and bisulphide of carbon, and by paying 3d. a dozen on all skins or scalps of Rabbits produced to the agents. In this way at least 157,000 dozen were brought in (equal to

1,884,000 scalps and skins), and paid for in two years. In New South Wales the sum voted by Parliament in 1886 for the destruction of Rabbits was £74,000, and in South Australia £30,000. The number of skins exported from Victoria in one year was 4,000,000, and the area infested about 20,000,000 acres more or less. In New Zealand the legislature took the matter in hand in 1876, and enacted strongest laws for the destruction of Rabbits. In 1881, on account of the damage done by these pests, more than 500,000 acres of sheep-runs were abandoned, the loss to the exports of the colony being estimated at 2,500,000 dollars per annum, while upwards of 180,000,000 Rabbits were killed in New Zealand in little over three years.

Referring to the fecundity of the Rabbit, Mr. Morgan says it may be asserted on good grounds that one pair under the most favourable circumstances increase, in two-and-a-half years, to the enormous number of 2,000,000, assuming the district suits them. But, assuming they only increase to one-fourth of that number, it will be seen how necessary it is to be on the watch to destroy them. He concludes his Report by observing that, although the estimated damage by Rabbits would be difficult to ascertain, it may be safely stated that during the last ten years the loss in Australia in various ways has amounted to at least £3,000,000 sterling.

Under these circumstances, when shooting, trapping, and poisoning have alike proved ineffectual, it is not surprising that the Colonial Government should decide to offer a very considerable reward to any one who should devise a satisfactory method of wholesale destruction, and by actual experiment prove its efficacy to the satisfaction of commissioners appointed by the Government. The reward, in fact, which has been offered by the Government of New South Wales is £25,000, as intimated by a public notice dated Sydney, 31st August, 1887, and the payment of this sum is made conditional upon the plan recommended being not only new and effective, but absolutely harmless to sheep, horses, dogs, and other domestic animals.

Upon the announcement of this official notice in the Paris '*Le Temps*' of November 9th, 1887, it naturally attracted the attention of M. Pasteur, who shortly afterwards (Nov. 29th) addressed a letter to the editor of that journal, in which he stated his views on the subject. In the opinion of M. Pasteur,

the methods hitherto employed were ineffectual, because they affected only the individual Rabbits actually killed by direct contact of poison, trap, or shot, and extended no further. What was needed, he considered, was the administration of something fatal which could be communicated, as a contagion, and spread throughout the entire Rabbit population of whole districts. This medium he believes he has discovered in the so-called "chicken cholera" (*cholera des poules*), which may be communicated by a cultivation of the microbes producing it, which may then be introduced amongst the vegetation on which the Rabbits feed. Experience has shown that the occasional ravages of this epidemic in poultry-yards is undoubtedly due to the droppings of the fowls first affected, which contaminate the soil and the food thrown upon it; and further experiment has demonstrated that Rabbits are liable to be affected by this disease by watering their food with a liquid charged with microbes obtained by boiling down food already contaminated.

In a communication addressed in January last to the Agent-General for the Colonies, M. Pasteur detailed various experiments which he had made upon Rabbits, first in hutches, and then in open, enclosed spaces, the result of which went to show the soundness of the views he had expressed.

On Nov. 27th he put five Rabbits in a hutch, and left them unfed until six o'clock in the evening. At 6 p.m., some cabbage-leaves which had been soaked in a liquor charged with the cholera-microbes were thrown into them, and were devoured in a few minutes. At midnight three fresh Rabbits, uncontaminated, were put in with them. The following morning at 8 o'clock the five Rabbits experimented upon appeared ill; at 11 o'clock two were dead, and at 3 p.m. the remaining three died. At seven in the evening one of the three introduced the previous midnight was found dead; the other two were not affected.

This experiment was repeated. On Dec. 3rd four more Rabbits were fed with infected cabbage-leaves, and at midnight four others were introduced, and not fed. The next day the former all died, and their dead bodies being allowed to remain in the hutch, the remaining four all died at intervals. These were tame Rabbits. On December 17th a wild Rabbit was similarly treated, and was found dead the next day. In every case it was demonstrated that death was due to the cholera microbe.

On Dec. 3rd and following days experiments were made on pigs, dogs, goats, sheep, rats, horses, and donkeys, in every case by feeding them with similarly contaminated food. Not one of these animals was affected.

Then followed an experiment on a large scale in the open air. Madame Pommery, of Rheims (whose name is well known in connection with the celebrated Champagne vineyards, of which she is the proprietor), having read M. Pasteur's letter in '*Le Temps*,' wrote to say that she had an enclosed rabbit-warren of about twenty acres, in which the Rabbits had increased so enormously, and had so undermined the walls, that she was anxious to do away with it, and if he pleased to make any experiments there, it was at his service. This being the very thing for his purpose, he accepted the offer, and his experiment was facilitated by the fact that the proprietor of the warren, with a view to prevent the Rabbits from trying to burrow out of the enclosure in search of food beyond the walls, had been latterly in the habit of throwing down, just outside the holes, heaps of lucerne and hay, on which they fed greedily. Nothing then was easier than to water this food with the microbe-bearing fluid, and the Rabbits were at once inoculated. This was done on Friday, Dec. 23rd, 1887. On the 26th Madame Pommery wrote:—

"On Saturday (in consequence of the fatal repast of the previous day) nineteen dead Rabbits were found outside the burrows. On Sunday the enclosure was not visited. On Monday morning thirteen more dead Rabbits were counted, and since Saturday not a single live Rabbit has been seen moving. Moreover, a little snow had fallen during the night, and not a footprint of any Rabbit was to be observed."

As a rule, they die in their holes, and the thirty-two dead ones which were picked up outside may therefore be regarded as a very small proportion of those destroyed. On Tuesday, Dec. 27th Madame Pommery wrote:—

"The lucerne placed outside the burrows on Monday evening has not been touched, and again no trace of footprints is perceptible on the snow. All are dead."

As to the number of Rabbits destroyed by this experiment, it is scarcely possible to fix it exactly, but M. Pasteur was informed by the men employed at the warren that that they estimated the number that formerly came out of an evening to

feed upon the eight great trusses of hay that were thrown down to them to be upwards of a thousand (*beaucoup plus d'un mille*).

So far as can be judged by the result of M. Pasteur's experiments, it would seem that he is in a fair way of earning the reward offered by the Government of New South Wales. At all events, it is to be presumed that the Commissioners will make no objection to his repeating the experiment in one of the districts under their jurisdiction, the more so as he assures us that while Rabbits are more susceptible of inoculation than fowls, the larger domestic animals are not likely to be injuriously affected should they by accident take up any of the contaminated vegetation.

It is due to another French *savant* to state that M. Ménézin, whose researches on the Gapes disease in gallinaceous birds, and on the parasite which causes it, have been already made known to our readers (Zool. 1883, p. 386), has proposed to inoculate Rabbits with a liver disease which is peculiar to them (*le phthisie du foie, ou coccidienne*), and which he has reason to believe would prove equally fatal; but we have seen no description of his *modus operandi*, and in the absence of this information, we are disposed to regard with favour the method suggested by M. Pasteur, which, from its simplicity in application ought certainly to succeed.

Those of our readers who may be desirous of having more details than we have been able to give in the limited space at our disposal would do well to consult the 'Annales de l'Institut Pasteur,' and an article by M. Tissandier, published in 'La Nature' (24 Mars, 1888), to which we are indebted for much of the information above given.

NOTES ON THE BIRDS OF CUMBERLAND.

BY THE REV. H. A. MACPHERSON, M.A.

SINCE the 'Birds of Cumberland' appeared, in 1886, the researches of Mr. W. Duckworth and myself have continued to make progress, and we now possess a fair amount of additional information regarding the Vertebrates of Cumberland and Westmoreland also. Much remains to be done; the next five years

will probably extend our materials liberally. As regards our views already published, we erred in one particular, *viz.*, in stating that the Sanderling, *Calidris arenaria*, "did not remain to winter with us." Its presence with us in winter has since been abundantly proved, but we still believe that this is the exception.

Not a little labour has been bestowed by one of us in sifting the papers of the late Mr. T. G. Heysham. These, though in many ways disappointing, and often painful to decipher, are constantly in unison with our own conclusions already published, and, in one or two cases, supply dates previously uncertain. It is our intention to issue reports on our local Natural History from year to year; those for 1886 and 1887-8 have successively appeared. In these it is only possible to touch upon a few points of general interest; but archæological and field-notes are duly entered up for future use. Mr. Duckworth has taken up residence at Ulverston, from which he hopes to take more or less frequent field excursions into Westmoreland.

The following notes may serve as a brief supplement to the 'Birds of Cumberland':—

Saxicola isabellina, Isabelline Wheatear.—Female, shot at Allonby, November, 1887, by Mr. J. Mann. Sent in the flesh to me, and presented to the National Collection, as the first example detected in Western Europe. ('Ibis,' Jan. 1888.)

Ruticilla phœnicurus, Redstart.—In a nest of the Pied Flycatcher, *Muscicapa atricapilla*, which we procured for the National Collection in 1888, Mr. Tandy and I found a young Redstart, which the old Flycatchers were rearing with their own proper brood.

Ruticilla titys, Black Redstart.—One seen on the outskirts of Carlisle, Nov. 12th, 1886.

Loxia bifasciata, White-winged Crossbill.—In the historical visitation of 1845, eleven were shot in Cumberland, nine of them in female plumage.

Octocorys alpestris, Shore Lark.—In addition to one specimen recorded, I know of two others killed on our seaboard.

Cypselus melba, Alpine Swift ('Birds of Cumberland,' p. 63).—The St. Bees bird—the only one known to have been killed in Cumberland—was obtained in July, 1842. It is now preserved at Crofton Hall by Sir Musgrave Brisco, Bart.

Gecinus viridis, Green Woodpecker.—A pair nested in South Cumberland in 1887, upon their northern breeding limit in Great Britain.

Hierofalco islandus, Iceland Falcon.—Accidentally omitted from all notice, in 'Birds of Cumberland,' was a female, killed at Winton, Westmoreland, figured by Mr. Goodchild (Trans. Cumb. and Westm. Assoc.). Mr. Goodchild tried to remount this bird, but the skin fell to pieces, and is now in the Carlisle Museum in a shattered condition.

Nycticorax griseus, Night Heron.—Two are included in 'Birds of Cumberland.' I have a record of a third, killed in Cumberland in 1847. Of these three one was adult, the others immature.

Platalea leucorodia, Spoonbill.—Among the Heysham papers I found a letter of one James Irwin, describing carefully the bird which, with some warranty from Sir W. Jardine, gave rise to the report that a Great White Heron was seen on the Solway in the winter of 1840-1. I have shown this letter to Mr. Howard Saunders, and we are satisfied that the bird in question was a Spoonbill.

Anser brachyrhynchus, Pink-footed Goose.—A large flock visited Naworth in January, 1887, and two were shot. A "gaggle" of thirty frequented Rockliffe Marsh in the winter of 1887-8, and one was shot. We have other notes of its occurrence, but it is a scarce bird. The Bean Goose, *Anser segetum*, is the ordinary Grey Goose of the Solway.

Anser leucopsis, Bernicle Goose.—From an experience in killing and handling these geese rarely equalled, Mr. A. Smith, of Rockliffe, can distinguish the sexes externally by the shape of the cranium.

Cygnus bewicki, Bewick's Swan.—Some adults were killed in the Lake District, January, 1888.

Spatula clypeata, Shoveller.—First proved to nest in Cumberland in 1886; nested in two quarters in 1887.

Fuligula cristata, Tufted Duck.—The hope that this species might "nest in Cumbrian waters" has at length been realised. A fine brood was reared in 1888 at no great distance from the Solway.

Harelda glacialis, Long-tailed Duck.—First obtained in the county in 1834 (Heysham, MS.). A score or so of birds appeared on the English Solway in October, 1887, nearly all females.

Oidemia fusca, Velvet Scoter.—Additional examples were shot

on the Solway in the winters 1886-7, 1887-8. It is a rare bird, however, with us, and a very wary one, difficult to secure even when hard hit.

Syrrhaptes paradoxus, Pallas's Sand Grouse.—Two specimens stand recorded as obtained in Cumberland in 1863. Mr. J. H. Gurney, jun., has most kindly brought to my notice a third, preserved in the collection of the late Mr. Dawson Rowley. In 1888, from eighty to a hundred birds—perhaps more—visited Cumberland between May and August. Twenty-one were shot before June 10th, after which our small influence began to tell in favour of preservation.

Porzana parva, Little Crake.—Mr. Heysham had a sketch taken from the county specimen, as I learn from a letter lent me by my friend Mr. H. P. Senhouse, of the Fitz, Cockermouth. This letter was sent by Mr. Heysham to Mr. Senhouse, senior. He borrowed the bird for the use of the artist he employed.

Scolopax rusticola, Woodcock.—Mr. T. C. Heysham examined a nest with eggs near Carlisle in 1837. It then rarely bred in Cumberland.

Sterna dougalli, Roseate Tern.—The bird alluded to as "shot many years since on Burgh Marsh," was killed in August, 1834.

Larus minutus.—A fine adult with black hood was shot in the neighbourhood of the Solway in the summer of 1886. Another, in winter dress, was seen in the spring of 1888. It is no doubt a much rarer bird with us than on the east coast of England.

Uria grylle, Black Guillemot.—Mr. Duckworth observed a single bird on the Solway in 1886. [When this species used to breed in the Isle of Man it was doubtless more often to be met with in the Solway; but a correspondent in the Island has recently informed us that it is no longer to be found there in the nesting season.—ED.]

In concluding these brief notes, let me express regret that so few trustworthy notices of birds appear in the public prints from the Lake District. Many counties furnish a number of observers; in Cumberland the task of scrutiny is almost entirely left to one, and information can only be collected by constant vigilance. It would be pleasant if visitors to our mountains would favour us, from time to time, with the results of their observations. Reliable statistics regarding birds, mammals, and marine fishes are especially desired.

ORNITHOLOGICAL NOTES FROM ST. LEONARDS.

By J. H. GURNEY, JUN., F.Z.S.

I HAVE the pleasure to send you a few notes from the neighbourhood of St. Leonards-by-the-Sea.

On May 7th a male Golden Oriole was shot at Battle, and sent to Mr. G. Bristow, the taxidermist, when the following mems. were taken:—Bill brownish red, mouth and tongue pale flesh-colour; length from tip of beak, 8 in. (Yarrell gives $9\frac{1}{2}$ in.); expanse, 14 in.; contents of stomach one large beetle. It is to be presumed the shooter was unaware that he is liable to a penalty under the Wild Birds Protection Act. Another "protected bird"—a Hoopoe—was shot at Bexhill. It seems from the 'Field' that Hoopoes and Orioles appeared about this time in several parts of England, and that the law was not so often kept as broken, a result which might have been safely foretold in respect of these foreign birds. On the 8th a Grasshopper Warbler was shot as it was uttering its cricket-like note about 6 o'clock on a sunny morning, and a Common Sandpiper was taken in a fishing-net, called a "kettle-net," at Camber. On the 11th another Grasshopper Warbler was shot, which, though a male by dissection, was, strange to say, in immature plumage; that is, it was very light on the breast, and the throat was very slightly spotted, with no tint of yellow about it. It does not seem to be a rare species at St. Leonards, the locality in question being very near the town; but, though I went there several times, I only once caught the faint, trilling sound.

There are some birds which are curiously rare at St. Leonards: in the course of four springs I do not think I have ever seen the Redstart or heard the Corncrake. On the other hand, the Black Redstart has often occurred, and almost all our other spring migrants are common; so abundant is Ray's Wagtail, that fifteen pairs, settled down to breed, may be seen in a morning's walk; yet the Grey-headed, though diligently searched for, was not discovered.

On the 26th Mr. Bristow received a Sand Grouse from Appledore, shot on the previous evening; I had this bird served with morrels, and found it very good, the inner pectoral muscle in particular being very tender. The keel of the sternum is

very remarkable for its depth. About the same time a covey of five or six were reported to Mr. Bristow, as seen at Filsham Farm. The black abdominal band in Pallas's Sand Grouse is variable both in extent and colour, being sometimes suffused with chestnut or mottled with buff-colour.

In the 'Natural History of Hastings,' compiled by the Rev. E. M. Bloomfield, there is a list of birds, and this is the only publication on local Ornithology; it enumerates several rare species, but one which is not included is the Slavonian Grebe, of which Mr. Bristow has an example, killed on a pond at Hollington, a suburb of St. Leonards, last February; and another which might be added is the Scandinavian Rock Pipit (*Anthus rupestris*), if it be a good species, of which I saw an unmistakable example at Bopeep, with a brilliantly vinous breast. But this was several years ago, and all agree that these Scandinavian Pipits have been extremely rare in Sussex of late years.

Mr. Bristow has several interesting birds in his laboratory at St. Leonards, which he is glad to show to visitors, among them a very pale Barn Owl, a young bird, received on the 24th of August from Brede, which, if not an albinism, is many shades paler than the ordinary tone of colouring in this species; another, like it, was killed about the same time and place.

On the 15th I was not sorry to have an opportunity of renewing acquaintance with the Kentish Plover and Sanderlings at Rye; the latter were very abundant for the time of year, twenty-eight in one flock. They have a way of running in and out of the foam and froth, which seems not to wet their plumage, feeding hard all the time, picking off the bottom the minute marine life, stirred up by the rapidly-advancing tide as they go. This is very pretty to watch, and a habit I have not noticed in the Dunlin. From the rapid action of their beaks the quantity they consume must be enormous.

The colony of Lesser Terns flourishes, and forty-three were counted in one flock, their position as they sat on the sand indicating more plainly than words that the wind was still in the east. The ferryman, who called them "scrates," said, however, they were nothing like as numerous as they once were. Only four Common Terns were seen, one of which was skirmishing with a Black Tern.

WINTER ROOSTING COLONIES OF CROWS.

BY C. L. EDWARDS.

(Concluded from p. 297.)

IN the following study of the colonies at Arbutus and Avondale, Md., I have attempted to describe the life of the colony during the twenty-four hours of day and night. The facts given are from observations made by the writer during the winters of 1886-87 and 1887-88.

A.—THE ARBUTUS ROOST.

Seven miles south-west from Baltimore, a half-mile south-east of Arbutus station on the Baltimore and Potomac Railway, is a tract of land of about a half-mile square on which are several patches of woods which furnish the roosting-ground and its neighbourhood for a winter colony of Crows. It seems from the testimony of the owners of this land that the Crows have roosted there for about twelve years, having previously occupied a piece of woods a half-mile or more to the westward, which they abandoned when house-building and wood-cutting by the inhabitants made it undesirable. Although this ground has been for some years the head-quarters of the colony, yet it has during that time made temporary changes to places within a radius of one or two miles. Within this more extended limit, in the memory of "the oldest inhabitant," which individual has lived near Arbutus for over half a century, the Crows have come to make their winter colony.

Dr. Godman says, "Such roosts are known to be thus occupied for years, beyond the memory of individuals; and I know of one or two which the oldest residents in the quarter state to have been known to their grandfathers, and probably had been resorted to by the Crows during several ages previous."

There is in the first-mentioned half-mile tract one particular piece of woods containing about fifteen acres of ground which seems to be the favourite roosting-place of the Crows, and from which, according as their numbers increase, they overflow into the surrounding woods and bushes. The trees are mostly of black oak, with some chestnut, white oak, poplar, and other common forest species, all of a decidedly "scrubby" growth, not being on an average more than twenty-five or thirty feet high. The woods are situated in a sort of valley quite surrounded with hills which

have been cut into jagged, fantastic forms in the several centuries of digging by the inhabitants for the rather poor iron ore of the region. The dumping of the refuse from these excavations in the hollow or valley has caused huge mounds here and there, and these, together with the well-eroded slopes of the small hills, give a decidedly picturesque outlook to the arid land.

The country being of poor soil is sparsely settled, and a glance at a map on which all the houses are indicated shows in a striking manner that this roost is in a region where are fewer houses than for miles around it. So these persecuted birds, over whose heads the Maryland statutes of outlawry have been hanging for almost two hundred years, would be stupid indeed if they had not learned to avoid man and his gun on every possible occasion, and to seek the most secluded spot available for a roosting-place.

The neighbouring farmers, with unusual good sense, seem to appreciate the value of the Crows, rarely disturbing them, and how far the colony understands this I will of course not attempt to say.

On a bright sunshiny day, up to within about two and one-half or three hours of sundown, the only Crows discoverable are the few which remain to feed in this territory, as their allotted ground, when the colony at dawn breaks up for the day. Perhaps, in addition, some that are blind or sick, too weak to fly far away, have remained at the roost. On a foggy or snowy day, however, more linger about all day, the main body is considerably delayed in dispersion, and the Crows come in earlier in the evening. Now, by about three hours before sunset on a clear day, evidently having secured their daily rations, these few fly to above one of the several gathering-grounds of the large flocks or detachments of the main body of Crows which are to come later. In the course of an hour the few already in are joined by one now and then until quite a number have come together, screaming out their "caws" vociferously and discordantly. This small flock may perchance fly over into the woods a mile to the westward, and by the time it returns in the course of fifteen or twenty minutes will have grown to a very large flock. As it settles down on a near corn-field with much fluttering of wings and very successful attempts at making a great noise, its individuals nervously hopping or flying from one spot to another, one is reminded of a flock of overgrown Blackbirds at the migrating season foraging

in some stubble-field for food. Suddenly, from some common impulse, the flock rises and moves away on an excursion for perhaps three or four miles. As the Crows rise and start away their noise is, if possible, increased, but gradually dies out as they approach the distant hill, and is quite lost before they disappear to sight on its further slope. When they are gone the wintry field which for an hour has been associated with the noisy birds seems quite desolate.

But now, as the sun is becoming large over the western hills, we see in almost every direction, singly, in pairs, in small groups, the Crows centreing toward the roosting-ground, and by the time the flock we first observed returns from its excursion it has become decidedly reinforced. Before settling down, the flock may again wander off for two miles or more, but so many new individuals are arriving that a number do not join the main body, but seek the tops of the black oaks as if settling for the night. It is about sunset when these first ones alight, and it is not long before twenty or thirty of the nearest trees on the edge of the woods will each have seven or eight black figures perched upon its topmost branches.

Just as the sun is sinking below the horizon the flock which wandered away returns, and so many more Crows have joined the force that it has grown to immense proportions. The sunset appears to be the signal for all Crows, individually or in flocks, to centre at the roost. They come then in long streams, irregular in outlines perhaps, but rather constant in numbers, and after sunset the incoming is almost without noise, save the sharp whirring of their wings.

Audubon says: "They may be seen proceeding to such places more than an hour before sunset, in long straggling lines and in silence, and are joined by the Grackles, Starlings and Reed Birds, while the Fish Crows retire from the very same parts to the interior of the woods, many miles distant from any shores."

Also Dr. Godman observes that "endless columns pour in from various quarters, and as they arrive pitch upon their accustomed perches, crowding closely together for the benefit of the warmth and the shelter afforded by the thick foliage of the pine. The trees are literally bent by their weight, and the ground is covered for many feet (?) in depth by their dung, which, by its gradual

fermentation, must also tend to increase the warmth of the roost."

But among those which have settled upon the perches there is a good deal of "cawing," which may serve to guide to the roost their fellows belated in the dark or storm. At times, if unusually disturbed, instead of remaining upon the trees they will fly back and forth, and high into the air, making considerable noise. Those coming in sometimes answer this signalling, especially if, as I witnessed in the case of a heavy snowstorm in December, 1887, they may have cause to be confused. As they appear suddenly from out of the distant darkness, or from the thickest of the swirling snow, a spectre procession without beginning and without end, one is haunted by the weird reality of the ghostly scene. We seem to be looking at Poe's "Raven" and all its earthly relations, coming as mysteriously as did that uncanny guest, in a series that shall end "nevermore!"

This body, however, is but one branch of what we must now compare to a vast army of Crows. And as this division is marshalled into camp, from at least two other directions great bodies are coming in streams, settling down upon the trees or flying high above them, outlined against the red after-glow of the sun. The air, as far as one can see toward the west, seems literally alive with Crows. It is as if one of those huge swarms of gnats which we are all familiar with in the summer sunshine had been magnified until each individual gnat was as large as a crow, without any diminution in the total number of individuals.

In the winter of 1886-87, as one of a party from Baltimore, I saw one of these vast divisions coming in for the night with singular regularity. It came from the north-east, and as it approached our point of observation was somewhat hidden by a clump of trees, until, within a hundred yards of us, the procession made a sharp bend, and the Crows were directly over the woods which constituted the roost. If you will imagine a river one hundred and fifty feet wide and about thirty feet deep, its end a huge cataract by which the water falls to lose itself in a large lake, its beginning farther away than the eye can see, and if instead of water you will make this river of Crows not so closely packed but that they can fly easily, and make the swiftness of the current equal to the ordinary flight of the Crow, you may gain some idea of the stream which our party watched for over an

hour without noticing any diminution in its bulk. And what a lake it made! When a gun was fired the Crows rose above the woods like a great black cloud, and when they settled again every available branch of the thousands of trees was utilized to afford them resting-places.

Mr. Rhodes says: "The aerial evolutions of this descending multitude, coupled with the surging clamour of those which have already settled as successive reinforcements appear, and which at a distance greatly resembles the far-away roar of the sea, may justly awaken emotions of sublimity in the spectator."

The Crow is ever a wary bird, and even after having perched for the night is easily disturbed. If one walks through the woods where the Crows are roosting, the nearest ones rise with the "caw" of alarm, and fly over the trees to the farther edge of the main body. If one walks steadily towards them they keep as steadily giving way in orderly wave-like retreat. I have thus followed this colony from copse to copse through the whole neighbourhood of its roost. If while walking one but stops, with no other movement, the Crows immediately suspect some treachery, and there is a noisy stampede of all within danger. Very probably they have learned that a gunner always halts when about to shoot.

On the morning of February 19th I saw the colony disperse for the day under peculiarly favourable circumstances. The sky was perfectly clear and well lighted by the stars and the moon in its first quarter. We reached the field within one hundred yards of the roost about half-past three o'clock in the morning. Because of some noise in walking over the frozen furrows, a few of the nearest Crows took alarm at our approach, and flew back a few rods into the woods; but this without the slightest noise, save the cracking of some branches or the whirring of their wings in the retreat. For over two hours all at the roost was silent as a graveyard, except that every now and then some restless individual, a sentinel perhaps, would utter a most peculiar croak, just like the louder note of a bull-frog.

But just an hour before sunrise, when the east was becoming faintly lighted, the Crows suddenly commenced awakening, and at the same time commenced "cawing." The few who led the measure were within one or two minutes joined by the full chorus of 300,000 or more voices, each apparently striving to be heard

by all the rest. Never before had I realised the almost infinite possibility of the Crow's variable "caw" in the production of discords. This great noise, which the poetic soul of Audubon conceived to be "thanksgiving" and "consultation," was kept up for twenty minutes before any movement was discernible. Then about a dozen Crows started off for the day's work, followed by more and more, until they were going from the roost much as they return to it in the evening, in three or more large streams. The Crows, however, were then much more scattered in the order of flying than in the evening streams. After they had been leaving thus for about twenty minutes, the streams constantly growing larger, a common impulse seemed to move a large number of Crows, and they did not wait to "fall in" as individuals, but suddenly joined the stream as a large flock. The streams were thus swollen in bulk quite regularly about every five minutes until the colony had dispersed. In an hour's time, or just at sunrise, the whole body, with the exception of twenty or thirty, evidently too weak to go far off, had left the roost. All this time the din of the general body does not seem to diminish, those left behind apparently doing double duty in the "thanksgiving," while those going away, as far as one can hear, do not fail to keep up their cawing. In this respect they differ from the evening streams, which in the main come in with but little if any noise. In seeing this morning dispersion I think one is impressed, even more than in the evening, with the vast number of Crows constituting the colony.

In the daytime the individuals are scattered all over the surrounding country, seeking food in the fields, along the shores of bay, river, and creek, one and two together, and then in rather large flocks at the glue factories and stock-yards if there chance to be such rich grounds in the neighbourhood. They disperse to a radius of from one to about forty miles over the fields and along the water-courses. I have seen them scattered all the way from Baltimore to Philadelphia on the one side and to Washington on the other. Of course these Crows were members of two or more colonies.

Mr. Rhodes says that "during winter a radial sweep of one hundred miles, described from the city of Philadelphia and touching the cities of New York, Harrisburg, and Baltimore, will include in the daytime, in its western semicircle, fully two-thirds

of the Crows (*C. americanus*) inhabiting North America, and at night an equal proportion in its eastern half." Mr. Rhodes was evidently not familiar with the fact of large numbers of Crows wintering in the far South and the West.

That they fly from very long distances is shown by the fact that there are usually a few individuals coming in with the main body who, upon reaching the roosting-ground, are so exhausted as to be unable to fly, and can only hop about as best they may to escape their ground enemies. Upon Dec. 17th, 1887, were caught two of these Crows, which, if I may so express it, had the "flyer's cramp," for in every other respect they were apparently in good condition, and are now in sound health. That the muscles of flight had suffered a partial paralysis is shown by the fact that in the course of a week they had so much recovered that, had not their wings been clipped, they would probably have flown away.

The successive layers of autumn leaves and excrement left by the Crows in winter have formed a remarkably rich compost for the naturally rather poor soil. Upon a field formerly a part of the woodland which formed this roost, but from which the trees were cut three years ago, much larger crops have been produced than from neighbouring fields. Upon this ground many plants new to this part of the country, such as "river weeds," have been noticed by the farmers. In some of the excrement from this roost sent to Dr. Merriam were identified the seeds of the sumach (*Rhus glabra*) and corn, but the seeds of a species of plant, much more numerous than either of these, could not be identified. Among the small stones, bits of brick, and sand and broken shells were found fragments of *Modiola hamatus* and *Arvicola riparius*. Thus it is evident what an important part the Crows play in plant, and possibly animal distribution.

In this colony I have identified both the Common Crow (*Corvus americanus*, Aud.), and the Fish Crow (*C. ossifragus*, Wils.). The two species live together very contentedly, although probably in the main seeking different feeding-grounds. I believe the Common Crows are much the more numerous of the two; but on the wing they are scarcely distinguishable, except by voice, and so the exact proportion of the two kinds is virtually unattainable.

It is an interesting, although rather discouraging, operation to attempt to separate the variously intoned "caws" and imagine the condition of mind each one represents. It is a veritable Babel! Old Crows, with a voice like the rasp of a file as it plays on the edge of a saw; middle-aged Crows, with long-drawn "caws" that have *andante* movements about them, destined to linger in one's ears after the musical apparatus has vanished from sight; and young Crows, just learning the difficult art of expressing their emotions, who get along excellently until, all of a sudden, their note terminates in something totally unexpected, like a boy at the adolescent age, when he is never certain whether he will talk falsetto or bass. But in all these different shades of tone there is that one unmistakable nasal basis which so clearly distinguishes the Crow's "caw" from all other bird-notes.

C. C. Abbott says: "Crows have twenty-seven distinct cries, calls, or utterances, each readily distinguishable from the other, and each having an unmistakable connection with a certain class of actions; some of which, as for instance the many different notes of the brooding birds, are only heard at certain seasons." Though we may not agree with such an exact classification, yet it is undoubtedly true that Crows express quite different states of mind by quite different notes.

A determination of the exact number of Crows here collected is not possible, but even the most sober observers place it among the hundreds of thousands. As a basis for an approximate calculation, I have made the following observations at the roost:—

With the aid of two friends, fifteen different square rods, taken here and there at random, were paced off, and the number of trees thereon capable of furnishing roosting tops counted. An average gave us nine and three-fifths trees per square rod. At any one roosting the Crows occupy about ten acres, or $(160 \times 9\frac{3}{5} \times 10) = 15,360$ trees. If on each tree fifteen Crows roosted—and that, if anything, is not too large an average—we should have 230,400 Crows in the colony.* Because of the dim light at sunset, my attempts at taking instantaneous photographs of the incoming streams of Crows were failures. A view, however, of

* It is difficult to realise the meaning of such a large number, and perhaps an illustration may help us. It happens that if one Crow came in each second, day and night, it would require just sixty-four hours for this number to assemble.

one of the gathering flocks, taken about an hour before sunset, as it flew by in a straggling stream, shows two hundred and seventy-three Crows in the photographic field. On this basis, the flying time (an average of a number of observations) for the bird to cross the field being fifteen seconds, in three streams coming in for one hour, we should have 199,560 Crows. But the streams toward the middle and end of the incoming are manifestly much larger than the above, so this number may be taken as a minimum estimate.

Dr. Godman says: "During hard winters many Crows perish, and when starved severely, the poor wretches will swallow bits of leather, rope, rags—in short, anything that appears to promise the slightest relief." I have often found Crows sick of various disorders which I shall not attempt to classify, going blind and starving, and in the aggregate for a winter many suffer the inevitable fate of mortals. I have found as many as eleven sick and recently dead Crows upon the roosting-ground in one day, and no doubt the Hawks and Opossums have found as many, for they are so boldly fond of the birds as to become noticeably increased in numbers in the region of the roost in winter, and of their visits well-picked bones scattered about bear testimony. But the consumers of Crows are not confined to Hawks and Opossums, for there is an old coloured man in the neighbourhood who eats the fresh birds, and when his larder is abundantly supplied, salts down the Crows for future use.

Having the total population of the colony and the average death-rate we may calculate the average age of the Crow. I think that a death-rate of five for each night at the roost, drawn as an average from a number of observations, is certainly not too low. Allowing that during the almost equal period the colony is away from the roost the same number die, we then have a daily death-rate of ten, or a yearly mortality of 3650 Crows. So a colony of 230,400 individuals would be a fraction under eighty years in dying off; or, in other words, the potential longevity of the Crow would equal about eighty years. It is well known,* at least

* "This bird sometimes lives for a century or more. Those have been seen in several cities of France which have attained this age, and in all countries, and in all times, it has passed as very long-lived."—Buffon, 'Histoire Naturelle,' tom. xviii., 1775, p. 32. "The Raven likewise is

traditionally, that the Crow is of remarkably long life, and although, as is easily seen, there are many obstacles in the way of anything but the barest approximation, yet I believe the above calculation is founded upon factors approximately correct.

B.—THE AVONDALE ROOST.

Through the kindness of Dr. Pattison, of Baltimore, I have been made aware of a roost near Avondale, Carroll County, Md. I visited this colony on March 3rd, spending half a day at the roost and in the immediate vicinity. The Crows here have selected the slope of a high hill upon which is a thick growth of deciduous trees, the oak and the chestnut prevailing. This hill belongs to a range extending some fifteen or twenty miles from north-east to south-west, parallel to the mountains which, some twenty-five miles away, can be seen from its crest. The exposure of the slope is toward the south, and so the Crows in adopting this site are quite protected from the cold northern winds which prevail in winter. There are large tracts of woods adjoining this roost, but only when driven away by shooting do the Crows leave this favourite hillside. They have roosted here for about ten years. The general life of this colony is much as at the Arbutus roost, and I should judge the two colonies to be of about the same size.

CROW LEGISLATION.

The legislation upon Crows in Maryland has been quite extensive, the first law for their destruction having been framed in 1704, in connection with one for the destruction of Wolves. A part of the section relating to Crows is as follows :—" . . . Every person that shall bring or cause to be brought to any of the Justices of the peace in any county within this province the head of a Crow with a perfect Bill shall be allowed the sum of six pounds of Tobacco and the Justice of the peace before whom such Crows heads shall be brought shall cause the Bill to be cut off to prevent the deceit of twice or oftener paying therefor." This law, in 1707, was continued for three years, then revived in

reported to live long, sometimes to a hundred years. . . . But the Crow, like unto him in most things (except in greatness and voice), lives not altogether so long, and yet is reckoned amongst long livers."—Bacon, quoted in *Essay on 'Comparative Longevity in Man and the Lower Animals,'* Lankester, London, 1870, p. 67.

1710. In 1713 a new Act was passed, putting the Squirrels also upon the list of outlawry. This act was continued in force by supplementary acts in 1716 and 1722. In 1728 a new general "Act to encourage the destroying of Wolves, Crows, and Squirrels" was passed. In it we find that "every master, mistress, owner of a family, or single, taxable in the several and respective counties within this province" shall be obliged to produce "three squirrel scalps or Crows heads for every taxable person they pay levy for that year." The penalty of not producing the required number of scalps or heads was two pounds of tobacco for each one lacking, and for any in excess a like allowance was made. This law was in force for thirty years, when it was repealed, and an Act specifying four Squirrel scalps or Crows' heads was substituted.

Special laws for redeeming heads or scalps in excess of the requirements of these general laws were passed for different and various counties of the State, in 1749, 1762 (Baltimore Co.), 1794, 1795, 1796, 1798, 1803, 1804, 1807, 1809 and 1816. In 1824 all Acts heretofore passed for the destruction of Crows in the several counties of this State were repealed. Then new special laws were passed in 1826, 1829, 1830, 1831, 1846, and 1847. In 1860, with the adoption of the first general code of laws for Maryland, Art. 31, concerning Crows, was inserted. In it was specified a bounty of $6\frac{1}{4}$ cents for each Crow's head brought in, provided an oath was taken that the Crow had been killed in the county where claim was made. In 1864, 1878, 1880, and 1884 (Baltimore Co.), the law was repealed for certain counties. In 1882, 1884, and 1886 new special laws associating with the Crows "Hawks and big Owls" have been passed.

I have consulted the general statutes now in force of all the States, and find only in one other State, Virginia, that a law concerning the destruction of Crows is extant. As early as 1796 a law was there passed requiring for every one tithable six Crows' heads or Squirrels' scalps. In the Code of Virginia for 1873 the right is given to each county to "allow or discontinue rewards for killing in such counties Panthers, Wolves, Foxes, Wild Cats, Crows, or Blackbirds."

I have read statements of laws having been passed in the early days of New England, and of such large numbers of Crows having been destroyed in one season that—the crops for the next season suffering a like fate from the "cut-worms" and other

insects—the inhabitants by repealing the laws were glad enough to encourage the Crows to come back.

The general effect of these laws has been to cause the destruction of large numbers of Crows. Dr. Godman has with graphic pen described the methods of hunting and slaughtering them in Maryland in the first years of this century.

It is interesting to learn from Mr. Henshaw that such near relatives of the Crow, the Blackbirds (*Agelaius gubernator*, Wagl., and *A. phoeniceus*, Linn.), at San Luis Obispo, collect in the fall and winter in immense flocks and roost in the swamps of "tulle" (a kind of bulrush). They do not come into the swamp in streams, but in large flocks, and these, diving down into the reeds, are very soon hidden.

This dwelling together in large flocks is also quite true of the Crow-Blackbird, or Purple Grackle (*Quiscalus quiscula*, Linn.), as we see in this latitude after the breeding season and until migration, and in the South during the winter.

NOTES AND QUERIES.

Death of Mr. Henry Stevenson, F.L.S., F.Z.S. — Our readers will learn with regret that our excellent friend and contributor, Mr. Stevenson, of Norwich, author of the well-known volumes on the 'Birds of Norfolk,' died at Norwich on the 18th August last, aged fifty-eight. For more than five-and-twenty years we have been accustomed to read in the pages of this Journal all kinds of interesting information from Mr. Stevenson's facile pen, and have for some time past deplored the fact that domestic trials and troubles had deprived him of that energy as a writer for which at one time he was conspicuous. As proprietor of 'The Norfolk Chronicle,' and contributor to other periodicals, notably to this Journal, 'The Field,' and the 'Transactions of the Norfolk and Norwich Naturalists' Society,' of which he was for some time Secretary, his name was well known, and few writers could furnish from personal observation more graphic descriptions than he could of the haunts and appearance of the wild creatures whose habits he loved to study whenever he could break away from literary work, and betake himself to one of his favourite "broads" or "meres" for a little quiet contemplation of nature. It has long been a matter of disappointment to his naturalist friends that he did not complete and publish the third volume, as contemplated, of his 'Birds of Norfolk.' We are glad to learn from a mutual friend that the materials for this volume have been preserved, and

that, in accordance with Mr. Stevenson's expressed desire, its publication will be undertaken in due course by Mr. Thomas Southwell, of Norwich. But we shall miss the master-hand of the author, and cannot but deplore the fact that he has not lived to complete what he so admirably commenced.

The British Association.—As announced in our last number, the 58th annual meeting of this Association will be held this year at Bath, and will commence on Wednesday, Sept. 5th, the President elect being Sir Frederick J. Bramwell, D.C.L., F.R.S., M.Inst.C.E. Amongst the Vice-Presidents are the Earl of Cork and Orrery, K.P., Lord Lieutenant of Somerset, the Marquis of Bath, the Bishop of Bath and Wells, the Bishop of Clifton, the Mayors of Bath and Bristol, Sir Frederick Abel, the Archdeacon of Bath, the Rev. Leonard Blomefield, Prof. Michael Foster, Mr. W. S. Gore Langton, J.P., Mr. Skrine, J.P., Mr. Wodehouse, M.P., Col. Laurie, M.P., and Mr. Jerome Murch, J.P. The General Treasurer is Prof. Williamson, the Local Treasurers for Bath being Messrs. Hammond, Murch, and Stone. The General Secretaries are Capt. Sir Douglas Galton, and Mr. A. G. Vernon Harcourt; Secretary, Mr. Arthur Aitchison; and Local Secretaries for Bath, Messrs. Pumphrey, Stothert, and Watts. In Section D., Biology, the President is Mr. W. T. Thiselton Dyer, C.M.G., M.A., F.R.S.; Vice-Presidents, Prof. Schäfer and Dr. P. L. Sclater; Secretaries, Messrs. C. Bailey, F. E. Beddard, S. F. Harmer, Walter Heape (Recorder), and Prof. H. Marshall Ward. The President of the Biological Section this year being a botanist, we cannot expect to hear of many zoological papers being read in that section, but any that may appear of interest to our readers will be brought to their notice in our next number.

MAMMALIA.

Bank Vole in Sussex.—May I add, in addition to other records, that the Bank Vole occurs in this part of West Sussex, but, owing to its shy and retiring habits and its rapid movements, often escapes notice? Some years ago (perhaps twenty), in clearing a large heap of garden rubbish, several Bank Voles were disturbed, and I captured three or four, but failed to keep them alive in confinement. I have only occasionally observed them since, but last summer (1887) a pair took up their quarters in an old fern-covered oak-stem just opposite my dining-room window. They seemed very shy in broad daylight, and, as a rule, only showed themselves when scuttling from one point to another.—WILLIAM JEFFERY (Ratham, near Chichester).

Bottle-nosed Dolphin in the Solway Firth.—On October 20th last, when walking with a companion along Mersehead Sands, parish of Kirkbean, Kirkcudbrightshire, we came upon a large Dolphin lying at high-water mark. The carcase was smelling strongly; the Gulls had got through the thick and tough hide, and were tearing out the viscera. Not having a knife with me strong enough to detach the head, nor any convenience for

carrying the latter if detached, I took the precaution of noting the colours, dimensions [length 9 feet], teeth, and sex (female), and left the body undisturbed, with a view to returning at an early date to secure the skull. From the state of the animal, and the situation where it was lying, I concluded it had lain on the spot for nearly a fortnight,—that is, since the last high tide,—and that it had been swept in from some part of the Barnhourie Bank—a broad tract of sand only covered at high water, and which extends out into the Solway for about six miles. I am tolerably certain that the animal had been in the first instance left helpless on Barnhourie at ebb tide, which here runs out with great rapidity, and that since its death the body had scarcely been in the water at all. I was not able to return for the skull for several weeks. In the interval the high tide had shifted the beast further up the shore, knocking out a good many of the teeth in transit, and the Gulls had also injured the extremities of the upper jaws considerably. However, I took off the head,—by this time in a decidedly unsavoury state,—brought it home, and, having cleaned it, forwarded it some time afterwards to Professor Struthers of Aberdeen, for proper identification. This being the first Dolphin I had seen in the flesh I was unable to name it with certainty, but I felt pretty sure it was the Bottle-nosed Dolphin, *Delphinus tursio*, and I have recently had a note from Professor Struthers to say it is that species. When the late Mr. E. R. Alston wrote his account of the “Mammalia of Scotland” for the Natural History Society of Glasgow, in 1880, he was unable to cite more than two Scottish specimens of *Delphinus tursio*, although he added, on the authority of Dr. Murie, that herds of this species are occasionally seen off our West coast. This Dolphin is an addition to the Solway list of Cetacea, which hitherto has comprised only the Porpoise, Common Rorqual, Bottle-nosed or Beaked Whale, Pilot or Ca’ing Whale, Grampus, and a somewhat doubtful record of the Common Dolphin.—ROBERT SERVICE (Maxwelltown, Dumfries).

BIRDS.

Pallas’s Sand Grouse in Ireland.—The subjoined particulars respecting the occurrence of Pallas’s Sand Grouse in Ireland reached me from the following sources. From Mr. Williams, Dame Street, Dublin:—“Two female specimens were received from Mr. W. C. Burton (Carrigaholt Castle, Co. Clare), on May 28th. They belonged to a good-sized flock which was seen on the seashore near that gentleman’s estate. Two female specimens were shot on May 26th, on the property of Mr. David Sherlock (Rahan Lodge, King’s Co.). Three more were noticed on this occasion and several times after, being protected, so that they might have an opportunity to breed. On June 11th two female specimens were sent from Galway; but, having been kept too long, they were unfit for preservation. On June 16th

a female Sand Grouse was picked up on the railway embankment at Clontarf, Co. Dublin, having been maimed by flying against a telegraph-wire. A male specimen was forwarded from Athlone, by Mr. W. Turkington. Two were shot out of a flock of five." From Mr. James Tank, taxidermist, Aungier Street, Dublin:—"One specimen was received in the beginning of June from Bellmullet, Co. Mayo. It was shot while being pursued by a hawk. Four others were seen in the same place, two of them being killed. The gentleman who sent the first-named Sand Grouse (the Rev. Henry Hewson) does not know what became of them." Besides the above-mentioned specimens of *Syrrhaptes paradoxus* from Irish localities, I hear that one was received by Mr. R. J. Ussher from Co. Wexford, and one (a male) by Mr. R. M. Barrington, of Fassaroe, Co. Wicklow. I may add that I have myself seen most of the specimens above recorded, and that two of them—viz. one from Mr. Burton and another from Mr. Sherlock—have been presented to the Natural History Museum, Dublin.—ROBERT F. SCHARFF (Nat. Hist. Museum, Dublin).

Sand Grouse in Yorkshire.—I have had sent to me a pair of Pallas's Sand Grouse, which were shot out of a flock of about twenty-five, at Burniston, near Scarborough, on May 16th.—RILEY FORTUNE (Harrogate).

Sand Grouse breeding in Durham.—A correspondent writes "A nest with three young is near here." I hope they will have flown before this is printed.—S. L. MOSLEY (Huddersfield, July, 1888).

Sand Grouse breeding in Cumberland.—We have just seen (Aug. 22), in the hands of Mr. Stevens, the well-known Auctioneer, of King Street, Covent Garden, two undoubted eggs of Sand Grouse stated to have been taken near Carlisle in June last. As he was unable, beyond this, to supply any information, we hope that our correspondent, Mr. H. A. Macpherson, may be able to ascertain and report further particulars of so interesting an event. They were offered for sale on August 21st, and bought in at a reserved price.

Sand Grouse at the Land's End.—I have at the present time in my possession (August 18th) a male specimen of Pallas's Sand Grouse alive. It was one of a flock of eleven seen at the Land's End in May last, of which three were killed and this one captured. I hope to restore it to health sufficiently to send it to the Zoological Society's Gardens. I should have advised you of the occurrence of this flock before, but I had no personal knowledge of it, and I never care to report the occurrence of any specimen on mere hearsay.—THOMAS CORNISH (Penzance).

The Crossbill in the Hebrides.—Although a well-known bird in Western Scotland, and an irregular visitor to Shetland, the Crossbill, *Loxia curvirostra*, has not been recorded hitherto from the Inner or Outer Hebrides. I have therefore great pleasure in recording its presence in

Eigg and Skye. A flock of at least sixty birds reached Eigg on July 3rd, and on the 27th of the month a smaller flock was observed in the island of Skye, as I learn from Mr. G. S. Dumville Lees, who is always most helpful in assisting to work out the Ornithology of that faunal area. Since the year 1868, when as a small boy I used to exercise a catapult upon the flocks of Crossbills then frequenting the pine-woods of Bournemouth, I have enjoyed a good many opportunities of studying the ways of this species, but never until this summer in Eigg had I the pleasure of seeing Crossbills feeding on Aphides. Some interesting notes on caged Crossbills will be found in Mr. C. M. Adamson's work, 'More Scraps about Birds,' especially as regards their feeding on green peas. I have had a great many caged Crossbills myself during the last sixteen years, and I am surprised to find that Mr. Adamson's birds "did not bathe." Mine were always very partial to a "cold tub." I may remark that Crossbills have been unusually numerous in the north-west of England since December, 1887. Their presence is reported to me from Grange, Millom, and Appleby, and they have certainly bred this summer near Penrith, though neither Mr. Tandy nor I succeeded in obtaining a nest.—H. A. MACPHERSON (Carlisle).

Crossbills in Co. Westmeath.—On August 1st a flock of twenty-four Crossbills might have been seen, close to our house, busily engaged in opening spruce fir cones, which are unusually abundant this year: one was shot, and proved to be a small and immature specimen of this season, just changing from its nesting plumage into the bright red tint which distinguishes the adult male Crossbill, and leads us to believe that the birds were reared in, or near, our plantation.—FRANCES J. BATTERSBY (Cromlyn, Rathowen, Co. Westmeath).

Migration of the Crossbill.—Several Crossbills occurred at the Spurn on the 13th and 14th of July, on the sand-hills between the Lighthouses and Kilnsea Beacon: one also was taken on board the Bull Lightvessel, off the mouth of the Humber, and kept for a week, when it escaped and flew away. Since the 16th of June great numbers have visited Heligoland in flights of from ten, twenty to fifty. Mr. Gätke informs me that the hawthorns in his garden were crowded with them, and that on some days there must have been hundreds dispersed amongst the foliage. All were adults; not a single striped young one amongst them.—JOHN CORDEAUX (Great Cotes, Ulceby).

[We have heard of a good many Crossbills this summer in different parts of the country. In July a flock of these birds was observed in Skye, as reported in 'The Field' of August 4th and 11th,—a noteworthy fact, as we believe the Crossbill had not been previously observed there.—ED.]

Cuckoo in the City.—On the afternoon of August 16th a bird which we at first took for a Kestrel, but which proved to be a young Cuckoo, was

killed among the trees in the churchyard of Christ Church, Spitalfields. It was fully fledged, but flew very feebly, and was evidently so faint from fatigue or hunger that it would probably have fallen a prey to cats during the night. The feathers bore no traces of its ever having been caged. I may add that during the past summer two Quails have been seen in the same churchyard, but these had evidently escaped from the Great Eastern Railway depôt near at hand, whither the Quails are brought which supply Leadenhall Market.—J. H. KEEN (Church House, Spitalfields).

The Cuckoo calling in July.—For the past five years I have heard the Cuckoo uttering its full call in this neighbourhood well into July; but this year I heard him up to the 13th of the month. What is the cause of this alteration in the bird's habits?—W. R. TATE (Walpole Vicarage, Halesworth).

[It can scarcely be regarded as anything more than an individual peculiarity.—ED.]

Richardson's Skua in the Island of Barbados.—On the morning of the 10th of July, 1888, there was brought to me alive a beautiful specimen of *Stercorarius crepidatus* (Gmel.). It is in full mature plumage, of the dusky garb, without a single feather showing evidence of immaturity. I should call it a typical adult specimen. On dissection it proved to be a female, the ovaries enlarged, some of the rudimentary eggs being of the size of No. 4 shot. The bird was rather thin; its stomach contained fish-bones and a green substance. The man who brought it to me stated that he captured it in the water, with a hand-net, close to the shore, at daybreak of the same day he brought it to me. There had been heavy squalls of wind and rain over the island during the preceding night from N.E. The bird was evidently worn out, or would not have allowed itself to be captured in that manner. I am not aware of a prior instance on record of the capture of any of the *Stercorariinae* in the West Indies, though doubtless their winter migration extends to the Caribbean Sea. The appearance of the Arctic Skua, at this season of the year, on the shores of Barbados, is certainly a most unlooked-for occurrence. At this season of the year this species is engaged in rearing its young in high northern latitudes, and what could have induced an adult bird to remain under the tropics at midsummer is an enigma to me. I carefully dissected the bird, and found no trace of any injury; its plumage was in very good order, and the bird, though rather thin, by no means emaciated, whilst the ovary was enlarged and healthy.—H. W. FEILDEN (Barbados, July, 1888).

Short-toed Lark in Sussex.—On July 27th I examined a living example of this bird, *Alauda brachydactyla*, in the possession of Mr. Cooper, the well-known taxidermist, of 28, Radnor Street, St. Luke's, who informed me that it was taken in the net of a birdcatcher at Amberley, Sussex,

on the 18th of the same month. It was a bird of fully a year old.—HOWARD SAUNDERS (7, Radnor Place, W.).

Bee-eater in Co. Cork.—Several gentlemen having expressed doubts as to the origin of the Bee-eater which I referred to in the June number of 'The Zoologist' (p. 226), I should like to state that the bird was offered to me *in the flesh* from Cork, and I received it in a perfectly fresh condition. I have no doubt as to its having been really shot in Co. Cork, as mentioned in my previous note.—ROBERT F. SCHARFF (Nat. Hist. Museum, Dublin).

Attacks by Owls.—Stories of Owls attacking persons passing their haunts at night are occasionally current in districts where these birds are common: but as such occurrences are probably not very frequent, the following may be worth notice:—On the night of May 31st last, my brother, Mr. H. W. L. Haigh, was walking along a road leading through a narrow rocky gorge in a neighbouring parish, when he was surprised by something striking him on the head and knocking off his cap. This was repeated two or three times before he became aware that his assailant was an Owl. On the following night I accompanied him to the same spot, and on my passing the rock indicated, the bird immediately came down, striking my hand, which I put up to ward off the blow, and inflicting several deep scratches. It did not, however, attack me again, although I repassed the place several times. A man whose cottage was situated immediately under the rock told us that for some time past this Owl had been the terror of his family, attacking the children, the cat, and even the fowls if they ventured out of doors after dark. We also learned from him that the nest was in a cleft of rock just over the house and contained two young birds, one of which had that morning fallen down into his garden. He showed us this bird, which was a Brown Owl, *Syrnium aluco*, fully fledged, and almost ready to fly. I had it replaced in the rock at once, and shortly after was pleased to hear that they had left the nest in safety, and that the old bird had discontinued its pugnacious habits.—G. H. CATON HAIGH (Aber-iâ, Penrhyndeudraeth, Merionethshire, North Wales).

Fulmar Petrel and Gull-billed Tern at Hunstanton.—I have lately seen a fine adult Fulmar Petrel, *Fulmarus glacialis*, which was shot at Hunstanton in January last, and is now in the collection of Dr. Whitty. This gentleman's interesting collection of local birds also contains a Gull-billed Tern, *Sterna anglica*, shot in July, 1878, not far from Hunstanton Station, and taken to its present possessor in the flesh. I do not think this bird has been recorded.—JULIAN G. TUCK (Hunstanton).

Dipper nesting in Trees.—Mr. Rooper has done good service in reporting the nest of the Dipper, *Cinclus aquaticus*, which he found built in a tree; but this situation, while very unusual, is by no means unprecedented. In 1885 my friend Mr. W. Duckworth found two nests of the

Dipper placed in trees overhanging the Cumbrian river Eden. One of the trees was an oak, the other a willow. The nests were preserved, and the pair which nested in the willow brought off their young ones safely in 1885, 1886, and 1887. They may have nested there this year also, but I have not had time to visit the spot this year. The fact is briefly noticed in Mr. Howard Saunders's new 'Manual of British Birds,' and will be found recorded in the 'Transactions of the Cumberland and Westmoreland Association,' No. xi., 1887, p. 29.—H. A. MACPHERSON (Carlisle).

Varieties of Common Birds in Yorkshire.—A friend recently asked me to call and tell him what a bird was, which had been picked up dead and given to him: on seeing it I found it to be a perfectly white Lesser Redpoll. During the present year I have had brought to me a pure white Starling, and a pair of House Sparrows white with the margins of the feathers on the upper parts rust-colour; these were full-grown young birds, and probably both came from the same nest. They are now in the Rev. G. D. Armitage's collection at Lutterworth. I have also a white Sky Lark, a pale grey and pied Blackbird, and a Ring Dove with a grey back, killed in this district.—S. L. MOSLEY (Huddersfield).

Shoveller and Rough-legged Buzzard in Surrey.—During March last I paid a short visit to Guildford, and on my arrival some relatives informed me that a strange bird had been shot by a friend of mine, Mr. C. Land of Horsley, and taken to the local taxidermist for identification, but the only information that they could obtain was that it was some kind of duck, species unknown. Being curious to get to know what it could be I visited my friend the next day, and found it to be a male Shoveller, *Spatula clypeata*, in good plumage. This bird, as far as I know, has only been recorded a few times previously as occurring in Surrey. The same gentleman showed me a fine Rough legged Buzzard, *Buteo lagopus*, that he had shot at Horsley during the previous autumn (exact date forgotten). This species has several times occurred near Godalming.—F. R. FITZGERALD (Harrogate).

Redstart nesting in a Thrush's Nest.—In June last Mr. Bell, of Liddell Bank, Dumfriesshire, an enthusiastic field naturalist, was kind enough to ask my friend Mr. Baily and myself to spend a couple of days in birds'-nesting with him on the Liddell. I was detained at home, but Mr. Baily went, and on his return reported the find of a Redstart's nest built into an old nest of a Song Thrush. There was no doubt about the ownership of the nest, for the hen bird was seen sitting on her eggs, two of which were taken. On hearing this I suggested that the nest might be acceptable for the Natural History Museum, and it has since been sent to me for presentation there, together with the remaining three eggs. The Thrush's nest measures about four inches across, and that of the Redstart

two inches and one-fifth inside measurement: the former was placed in a thorn-bush, and was therefore open to the sky, though well screened by branches above. I have seen a good many Redstart's nests, but I can only recall one instance in my own experience in which a nest of *R. phænicurus* has been open to the sky. The nest in question was placed in a thick bush, and was surrounded by thickets.—H. A. MACPHERSON (Carlisle).

Rock Thrushes, in their Native Haunts and in Captivity.—June is the month for a naturalist, be he zoologist or botanist, to visit Switzerland and Northern Italy; such a multitude of flowers, such interesting birds, which though not to be found so frequently as are the flowers, yet are all the more delightful when they are met with; and it is of the latter that I would write a few words about, more especially mentioning the two species of Rock Thrushes, viz., the Rock Thrush, *par excellence* (*Petrocincla saxatilis*), and the Blue Rock Thrush (*Turdus cyaneus*). I was at Lugano last June for a month, and birds being my *grand passion*, what could I do but look about for them, not contenting myself with a mere passing glimpse, but trying to secure some callow brood to rear up and make pets of. Now I knew that both the above-mentioned species must in the summer time be natives of the surrounding mountains, so almost the first morning after my arrival in the quaint old town, nestling down by the shores of one of those lovely lakes of Northern Italy, I started out at five o'clock,—one cannot stay in bed on a real summer morning in Italy,—and found my way along a white, dusty road to the foot of San Salvatore, which, as everyone who has been to Lugano knows, rises up quite close to the town in the shape of a huge molehill. Nature has been exaggerating as well as other good people whom one meets with; but then what is a failing in them is not so with her, and if she has chosen to make a mountain out of a molehill, why the world is the gainer; at any rate, I know I was on this morning of which I am writing, for although I neither saw nor heard anything of the birds for which I was searching, yet I was rewarded by a glorious view, the sun rising and throwing his light on to the distant mountains, apparently not such early risers as myself; for there they were snoozing like great giants with white nightcaps—the caps of eternal snow. Monte San Salvatore, although thickly covered with an undergrowth of hazels, overtopped by Spanish chestnuts and other trees, seemed to be lacking in bird-life. There were some Blackcaps about, and near the foot some Nightingales; and how the Nightingales sing in Italy! Is it fancy that their voices are richer and their notes more varied than their English cousins? or is it merely that everything being so brilliant and beautiful, one comes to the conclusion that of course the Nightingale's song is, too? Well, I thought I had better find some peasant—some nice, obliging Italian—who could and would put me on the track of a Rock Thrush; and so I was rowed across, on a very

hot, sultry afternoon, in a *dolce far niente* sort of a way, to the foot of Monte Caprino, which bounds the lake of Lugano on the opposite side to the town itself, and there I was introduced to my bird-guide that was to be. He, however, not knowing the birds by their French names, and I not knowing them by their local Italian ones—the limit of his ornithological knowledge—we found a difficulty in coming to a conclusion as to the species required, until I took my paints and made a rough sketch of the two kinds. “Ah,” he said, pointing to the Blue Thrush’s portrait, “*Passera Solitaria e Collossera*,” he added, dabbing rapidly with his finger at my scribble intended to represent the Rock Thrush. “*Collossera*” is, I presume, a local corruption of “*Codirossone*,” which Messrs. Sharpe and Dresser give as the Italian name for this bird. [The best lists of Italian provincial names of birds will be found in Professor Giglioli’s ‘*Avifauna Italica*.’—ED.] So he told me that he could easily procure me a brood of this kind; but the *Passera Solitaria*, that was quite another thing, for they build much higher up, and in the face of the precipices, where the nest is most difficult of access; but he would try his best. And so he did; for on rowing across, a few days later, I was delighted to find that a brood of Rock Thrushes had been discovered; so off we set to look at the nest, which we came to after a good deal of toiling up the dry bed of a torrent, and some stumbling over the loose boulders and stones, with steep banks on each side thickly covered with shrubs, grass, and trees. Then came a warming scramble up one of these banks, with the brown Lizards darting away at every step, then a final hoist up until I could just cling on to the tufts of grass and see into the nest, which was very much like a Blackbird’s, but built in the side of the bank, where the ground had been hollowed away, apparently by the old birds, who on this occasion did not put in an appearance. In the nest there were three young birds of about a week or nine days old, and one pale blue egg, minus spots of any kind. As I wanted more than one bird I took the nest as it was, and triumphantly carried it, with its contents, back to Lugano. They prospered beyond all hope, and are now three fine young birds, fast donning their winter plumage, two males and one female, as far as one can judge. My bird-hunter found me a nest of the Blue Thrush, but in a quite inaccessible spot—viz. in the face of a huge rock rising precipitously out of the lake; about 100 feet up there was a small hole, and as we sat in the boat below, a Cuckoo flew quite close past this hole, when immediately a Blue Thrush darted out, chasing the intruder along the face of the rock until both pursuer and pursued disappeared over the top, which little occurrence convinced me that my guide was right as to the whereabouts of the nest of the *Passera Solitaria*, and it is in these sort of places that this bird usually builds. In the neighbourhood of the Italian lakes it is thought much of as a cage-bird and a songster, whilst the Rock Thrush is rather ignored, and

I was almost jeered at by all to whom I showed my young Thrushes for taking so much trouble to rear such good-for-nothing birds; for all that I did not give them up, believing them capable of turning out very good songsters, and very charming in every way. It was in the little town of Mendrisio, at the foot of Monte Generoso, that I procured a young Blue Thrush of a month old. Poor little bird! how glad I was to get him home to Lugano and wash him, for his feathers were caked with dirt. The Italian "paese" and small tradespeople, so dirty in themselves, seem to think their captive birds are equally indifferent to cleanliness; for my young Thrush had been reared by an old man, the occupier of a dank and dark tobacco and eating shop, who, by-the-bye, possessed the only Rock Thrush I saw in captivity—a fine male bird of the previous year's rearing, in very fair plumage, the blue head and chestnut breast being fully assumed—most resentful of any foreign interference, and pecking fiercely at my fingers when I held them to the bars of the cage. As to the young *Passera*, he grew apace, and eat I should be afraid to say how much. As I write he is sitting near me, a full-grown bird in perfect winter plumage, apparently not regretting his exile from snow-capped mountains and vine-clad valleys.—HUBERT D. ASTLEY (Henley-on-Thames).

Young Rooks with White Chin-spots.—The note by Mr. Miller Christy (p. 302) is very interesting. I recently obtained an almost full-grown young Rook with a large, pure white patch on the chin, extending two inches from the base of the bill and up to the rami of the mandible; the first three or four primaries on each side are also white. On mentioning this bird when at Mr. Bond's, he pointed one out in his collection marked *exactly* in the same way. It is curious how certain marked varieties are recurrent.—S. L. MOSLEY (Huddersfield).

Tree Sparrow breeding at Harrow.—On referring to "Yarrell" (4th edition, vol. ii., p. 85), I find it stated that Middlesex is one of the English counties in which this bird has not yet been recorded as breeding, "but it has probably been overlooked." I do not know whether it has since been recorded from Middlesex, but if it has not, I can testify that it breed annually in the neighbourhood of Harrow, in that county, showing an evident increase since 1876, when the 'Flora of Harrow,' with a list of the birds, was published, in which it is stated that the Tree Sparrow is "uncommon, but seen occasionally in small flocks during the winter."—G. E. H. BARRETT-HAMILTON (New Ross, Co. Wexford).

[See 'The Zoologist,' 1887, p. 24.—ED.]

Swallows nesting In-doors.—In July last a pair of Swallows built their nest in the cornice of a sitting-room in constant use; the windows of the room, though open all day, were, with one or two exceptions, closed at night; supper was served in the room, and not unfrequently pipes were

lighted: nevertheless the building of the nest proceeded, it was lined, and evidently finished. But it happened that on the 25th of July there were many visitors, and I suppose the noise and smoke were too much for the birds; anyhow they deserted the nest, and were not seen in the room afterwards. On July 28th I took down the nest, which contained one egg. In an unused bed-room, also, a pair of Swallows have nested and brought off their young. Another pair attempted to nest on a broom placed in the corner of an upstairs room, but were disturbed. But more curious still, a pair of Swallows have reared a brood in our steam wash-house, where the noise of the washing and wringing machines is simply deafening, and the room is filled with the vapour from the boiling water. Is it possible that the very wet summer has driven the birds to seek more sheltered situations for their nests than the chimney? Still this would not explain their choosing the rooms of a dwelling-house rather than some barn, of which there are plenty near, and which have been regularly used by some of them. A pair of Swallows, accompanied by a third, have for some years nested under a porch at the back door of "The Cottage," returning each year and repairing the nest: they came as usual this year, the first bird appearing on April 16th, and roosting each night on the nest; on the 23rd a second appeared, and afterwards a third; on the 28th a smashed egg was found on the ground; on May 11th the nest was on the ground,—from what cause it fell I know not. The birds appear to have sheltered for the night in a barn close by, for the following morning the heads and tails of two Swallows were found there, a pet cat having evidently appropriated the rest. Two days after a pair of Swallows were noticed surveying the spot where the nest had been; in another week they were laying the foundations of a new nest exactly in the old spot, and they have since completed this and brought off their brood. It would look as though the third Swallow (whose presence each year I cannot understand) had found a helpmate at once and built again on the old spot.—JOHN H. WILMORE (Queenwood College, near Stockbridge, Hants).

FISHES.

Sting Ray in Bosham Harbour, Sussex.—Two examples, which I have no doubt may be referred to this species, were taken while hooking eels and flounders in Bosham Harbour, in the early part of this summer. This fish is known to our local fishermen as the "Stinge," and is much dreaded by them,—so much so that in the second case the fish, a large one, was cut adrift rather than haul it into the boat to obtain the hook.—WILLIAM JEFFERY (Ratham, near Chichester).

Abundance of the Picked Dogfish in Killala Bay.—About the middle of July Killala Bay was visited by immense numbers of the Picked Dog-

fish, *Acanthias vulgaris*, which did great damage to the drift-nets of the fishermen and scared the salmon from the nets. These fish moved about in large shoals, and wherever they encountered the nets quite filled them. Indeed I was told of one catch filling three large yawls, and on July 17th I saw one boat come in with over a ton weight of Dogfish on board, but amongst this large boat-load I saw only two of the small spotted species, *Scyllium canicula*. They had evidently visited the shoal water of the Bay for the purpose of bringing forth their young, which were quite ready for exclusion, many actually producing their young on being taken on board the boats. There was a similar visitation of this species of Dogfish to our Bay and the adjacent coast in the summer of 1882, when they did so much damage to the net and line fishermen that fishing was entirely stopped until they had left the Bay for deep water.—ROBERT WARREN (Moyview, Ballina).

[For the benefit of those of our readers who may not be familiar with this fish, we may remark that it is one of the commonest of the Sharks (*Spinacidae*) which frequent our coasts. The name "Picked Dogfish" is evidently a corruption of "Piked Dogfish," so called from the two sharp "pikes" or spines which it carries on its back in front of each dorsal fin. Its predatory habits are well known to the fishermen, and the herring and pilchard fisheries are often seriously affected and depreciated by the attacks made upon them while in the nets, which are often much damaged in consequence. Some interesting statistics upon this subject will be found in Day's 'Fishes of Great Britain and Ireland,' vol. ii., pp. 316, 317, where a good figure of the fish is also given.—ED.

CRUSTACEA.

Dromia vulgaris on the Sussex Coast.—I have a specimen of this Crab which was sent me alive in May, 1886. It was obtained by scallop-dredgers in the channel off Newhaven, or Beachy Head.—WILLIAM JEFFERY (Ratham, near Chichester).

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 1, 1888.—Dr. D. SHARP, F.L.S., President, in the chair.

The Rev. R. Walton-Lewis, B.A., of Cape Colony, was elected a Fellow of the Society.

Mr. F. Du Cane Godman, F.R.S., exhibited a large number of species of Lepidoptera and Diptera recently collected for him in Mexico by Mr. Herbert Smith.

Mr. White exhibited a specimen of *Osmylus maculatus*, taken by him on the Stort, near Sawbridgeworth, in July last. He also exhibited parasites bred from *Bombyx neustria*, and a living example of *Heterodes Guyoni*, found at Dartford, and believed to have been introduced with Esparto grass from Tunis.

Mr. Enock exhibited a stem of barley, showing the appearance of the plant under an attack of Hessian Fly.

Mr. Stevens exhibited a number of galls collected at Byfleet, Surrey, in July last, by Mr. Leonard Stevens; also a specimen of *Coleophora solitariella*, with ichneumons bred from it.

Mr. Edward Saunders exhibited a specimen of *Catephia alchymista*, captured by his son at St. Leonards, in June last. He also exhibited specimens of a rare Ant (*Anochetus ghiliani*), which were taken at Tangier by Mr. G. Lewis. One of these he had submitted to Dr. Emery, of Bologna, who thought that, although ocelli were present, the specimen was probably intermediate between a worker and a female, and that possibly the true female did not exist.

Mr. Pascoe exhibited a number of species of Coleoptera recently collected in Germany and the Jura Mountains, and read a note correcting the synonymy of certain species of *Brachycerus* recently described by him in the 'Transactions' of the Society. He stated that the corrections had been suggested by M. Peringuey and M. Aurivillius.

Prof. Westwood communicated a paper entitled "A List of the Diurnal Lepidoptera collected in Northern Celebes by Dr. Sydney Hickson, with descriptions of new Species."—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Pallas's Sand Grouse (*Syrnhaptes paradoxus*), its history, habits, food, and migrations; with hints as to its utility, and a plea for its preservation. By W. B. TEGETMEIER. 8vo, pp. 24. With a coloured plate and three woodcuts. London: Horace Cox, 346, Strand. 1888.

CONSIDERING the amount of interest which has been excited by the recent immigration of flocks of this singular Asiatic species, it is perhaps not surprising that a certain amount of literature should spring up concerning it, not only in England, but in other parts of Europe, where its unwonted appearance this year has attracted the attention of all classes.

To some extent, it may be said, we were not altogether unprepared for this incursion, seeing that it is not the first time that the bird has visited us in some numbers, and it was, of course, within the bounds of possibility that it would come again from a repetition of the same operating cause. What this cause is no one has yet satisfactorily determined. In the opinion of Prof. Newton* it may be regarded as "the natural overflow of the population of *Syrrhaptēs*, resulting from its ordinary increase. It may have been striving to extend its range in all directions, and if so (he considers) it would assuredly have found the direction of least resistance." But to account for such a sudden and complete dispersal some further explanation seems necessary; and it appears to us not unlikely, as we have elsewhere suggested,† that a sand-storm of unusual severity, such as is known to occur in desert-lands, may have suddenly expelled the entire bird-population of the district over which it swept, driving them in their fright so far beyond the limits of a natural migratory movement at the approach of the breeding-season that, having once got beyond the desert plains and over inclosed and cultivated country, they would keep on and on in the expectation of finding ground attractive to them, until the necessity for food and rest would compel them to descend and alight. In this way only does it seem possible to explain their journeying so far westward as the British Islands, since we may reasonably assume that the birds might have met with tracts of country much nearer to their true home which would have suited them so well as to render any journey further westward unnecessary.

In the pamphlet before us Mr. Tegetmeier does not attempt any explanation of the cause of this invasion, but confines himself, as he tells us in his preface, to a description of the habits of the bird as furnished by ornithologists who have observed it in its native country; a popular account of the singular peculiarities of its structure; a short history of its remarkable migrations; and a plea for its preservation as an object not only of interest, but of utility.

* 'The Ibis,' 1864, p. 219.

† "The recent immigration of Pallas's Sand Grouse," in 'Life Lore' for August, 1888.

A coloured lithograph of the bird (copied from Dresser's 'Birds of Europe') conveys a good idea of its appearance to those who have never seen a specimen, although for our own part we prefer the coloured plate by Wolf in the first volume of Stevenson's 'Birds of Norfolk.'

The woodcut of the sternum, or breast-bone, figured on p. 16, is obviously borrowed from 'Yarrell,' and represents, oddly enough, a preparation of our own, made five-and-twenty years ago, when a living Sand Grouse, which had been deposited in the Zoological Society's Gardens, subsequently died there, and was forwarded to us.

Of the other woodcuts given (p. 15), one shows the upper and under surface of the foot, with its feathered tarsus, and below it is figured an egg, supposed to be of the natural size and shape, but which to our eyes does not by any means convey a good impression of its real appearance. The fact is, that the delicate texture and soft markings of birds' eggs cannot be properly represented by wood engraving, the outlines being invariably too hard, and the edges of the markings too unsubdued.

We might point out several typographical and other slips here and there, such as "furculam" for "furcula" (p. 16), "Navan" for "Naran" (p. 18), and the misapprehension (p. 14) that the specific name *paradoxus* was bestowed by Illiger. But these, doubtless, may have already caught the author's eye, and have been noted for correction should another edition be called for.

In the "Bibliography" given on the last page, we think Mr. Tegetmeier might well have included 'The Zoologist' for 1863 and 1864, since the volumes for these years not only contain a mass of correspondence on the subject of Pallas's Sand Grouse in the British Islands, but furnished the materials from which some of the subsequently published accounts quoted by Mr. Tegetmeier were compiled. But apart from this, his pamphlet will undoubtedly serve a useful purpose in disseminating information about a bird still comparatively little known to people in this country, and in encouraging the protection of a species which may prove to be of value from the sportsman's as well as the naturalist's point of view.

